

Objective: To solve logarithmic equations

Types of Equations:Extraneous solutions: any answer that produces the log of a negative numberType 1: LOG = # - use swirl method and solve.

1) $\log_3 243 = \text{?}$

$$3^y = 243$$

$$\boxed{y = 5}$$

2) $\log_9 x = -3$

$$9^{-3} = x$$

$$\boxed{x = \frac{1}{729}}$$

3) $\log_x 256 = 4$

$$x^4 = 256$$

$$\boxed{x = 4}$$

Try these:

4) $\log_{10} 4x = 2$

$$10^2 = 4x$$

$$100 = 4x$$

$$\boxed{25 = x}$$

5) $\log_2 2x = 4$

$$2^4 = 2x$$

$$16 = 2x$$

$$\boxed{8 = x}$$

Can only cancel if have one log on each sideType 2: LOG = LOG - cancel logs (if base is the same) and solve.

6) $\log_3(3x-6) = \log_3(2x+1)$

$$\begin{array}{r} 3x-6 = 2x+1 \\ -2x-6 \quad -2x+6 \\ \hline \end{array}$$

$$\boxed{x = 7}$$

Try these:

8) $\log_5(2x+7) = \log_5(3x+1)$

$$\begin{array}{r} 2x+7 = 3x+1 \\ -2x-1 \quad -2x-1 \\ \hline \end{array}$$

$$\boxed{6 = x}$$

7) $\log_2(x^2+7x) = \log_2(18)$

$$x^2 + 7x = 18$$

$$x^2 + 7x - 18 = 0$$

$$(x+9)(x-2) = 0$$

$$\boxed{x = -9, 2}$$

9) $\log_8(x^2+6x) = \log_8(16)$

$$x^2 + 6x = 16$$

$$x^2 + 6x - 16 = 0$$

$$(x+8)(x-2) = 0$$

$$\boxed{x = -8, 2}$$

H/W - pg 31 # 1-10

